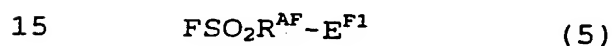
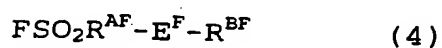
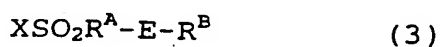


WHAT IS CLAIMED IS:

1. A process for producing a fluorine atom-containing sulfonyl fluoride compound, which comprises reacting a compound of the following formula (1) with a compound of the following formula (2) to form a compound of the formula (3), then, reacting the compound of the formula (3) with fluorine in a liquid phase to form a compound of the following formula (4), and further, decomposing the compound of the formula (4) to obtain a compound of the following formula (5):



wherein  $\text{R}^{\text{A}}$  is a bivalent organic group,  $\text{E}^1$  is a monovalent reactive group,  $\text{R}^{\text{B}}$  is a monovalent organic group,  $\text{E}^2$  is a monovalent reactive group which is reactive with  $\text{E}^1$ ,  $\text{E}$  is a bivalent connecting group formed by the reaction of  $\text{E}^1$  with  $\text{E}^2$ ,  $\text{R}^{\text{AF}}$  is the same group as  $\text{R}^{\text{A}}$ , or a bivalent organic group formed by the fluorination of  $\text{R}^{\text{A}}$ ,  $\text{R}^{\text{BF}}$  is the same group as  $\text{R}^{\text{B}}$ , or a monovalent organic group formed by the fluorination of  $\text{R}^{\text{B}}$ ,  $\text{E}^{\text{F}}$  is the same group as  $\text{E}$ , or a bivalent connecting group formed by the fluorination of  $\text{E}$ ,  $\text{E}^{\text{F1}}$  is a monovalent group formed by the decomposition of  $\text{E}^{\text{F}}$ , and  $\text{X}$  is a halogen atom, provided that at least one of  $\text{R}^{\text{A}}$ ,  $\text{R}^{\text{B}}$  and  $\text{E}$  is a group

which can be fluorinated, and at least one of  $R^{AF}$ ,  $R^{BF}$  and  $E^F$  is a group formed by the fluorination of  $R^A$ ,  $R^B$  and  $E$ , respectively.

2. The process for producing a fluorine atom-containing  
5 sulfonyl fluoride compound according to Claim 1, wherein  
X is a fluorine atom.

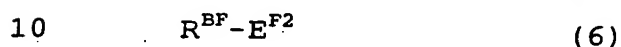
3. The process for producing a fluorine atom-containing  
sulfonyl fluoride compound according to Claim 1, wherein  
the fluorine content in the compound of the formula (3)  
10 is at least 30 mass%.

4. The process for producing a fluorine atom-containing  
sulfonyl fluoride compound according to Claim 1, wherein  
the molecular weight of the compound of the formula (3)  
is from 200 to 1,000.

15 5. The process for producing a fluorine atom-containing  
sulfonyl fluoride compound according to Claim 1, wherein  
 $R^{AF}$  is a bivalent organic group selected from the group  
consisting of a perfluoro bivalent saturated hydrocarbon  
group, a perfluoro(partially halogeno bivalent saturated  
20 hydrocarbon) group, a perfluoro(hetero atom-containing  
bivalent saturated hydrocarbon) group, and a  
perfluoro(partially halogeno(hetero atom-containing  
bivalent saturated hydrocarbon)) group, and  $R^{BF}$  is a  
monovalent organic group selected from the group  
25 consisting of a perfluoro monovalent saturated  
hydrocarbon group, a perfluoro(partially halogeno  
monovalent saturated hydrocarbon) group, a

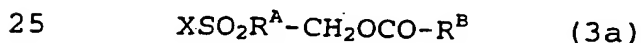
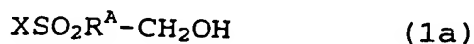
perfluoro(hetero atom-containing monovalent saturated hydrocarbon) group, and a perfluoro(partially halogeno(hetero atom-containing monovalent saturated hydrocarbon)) group.

- 5 6. The process for producing a fluorine atom-containing sulfonyl fluoride compounds according to Claim 1, wherein the compound of the formula (4) is decomposed to obtain not only the compound of the formula (5), but also a compound of the following formula (6):



wherein  $E^{F2}$  is a monovalent group formed by the decomposition of  $E^F$ , which may be the same as or different from  $E^{F1}$ , and  $R^{BF}$  is as defined above.

7. The process for producing a fluorine atom-containing sulfonyl fluoride compound according to Claim 1, wherein  
15 the compound of the formula (1) is a compound of the following formula (1a), the compound of the formula (2) is a compound of the following formula (2a), the compound of the formula (3) is a compound of the following formula  
20 (3a), the compound of the formula (4) is a compound of the following formula (4a), and the compound of the formula (5) is a compound of the following formula (5a):



wherein Y is a halogen atom which is the same as or different from X, and  $R^A$ ,  $R^B$ ,  $R^{AF}$  and  $R^{BF}$  are as defined above.

8. The process for producing a fluorine atom-containing sulfonyl fluoride compound according to Claim 7, wherein the compound of the formula (4a) is decomposed to obtain not only the compound of the formula (5a), but also a compound of the following formula (6a):



10 wherein  $R^{BF}$  is as defined above.

9. The process for producing a fluorine atom-containing sulfonyl fluoride compound according to Claim 8, wherein the compound of the formula (2a) has the same structure as the compound of the formula (6a), and at least a part of the compound of the formula (6a) obtained from the reaction product obtained by the decomposition of the compound of the formula (4a), is used as at least a part of the compound of the formula (2a) to react with the compound of the formula (1a), to continuously obtain the compound of the formula (5a).

10. A compound of the following formula (I) or a compound of the following formula (II):

